

WHAT IS CLAIMED IS:

1. An interference wave detecting device comprising:
 transmitting means for converting data to be transmitted
 5 from a base station into a radio signal of a predetermined
 transmission frequency, and for transmitting said radio signal
 to a mobile station;

receiving means for receiving either of a radio signal
 lying within a certain reception band of frequencies including
 10 a predetermined reception frequency from said mobile station
 and an interference wave signal lying within a certain
 transmission band of frequencies including said predetermined
 transmission frequency; and

controlling means for causing said transmitting means to
 15 stop transmitting said radio signal of said predetermined
 transmission frequency in order to detect said interference
 wave signal, and for enabling said receiving means to receive
 said interference wave signal only within a period of time
 during which said transmitting means stops transmitting said
 20 radio signal of said predetermined transmission frequency to
 said mobile station.

2. The interference wave detecting device according to
 Claim 1, wherein when said receiving means has received and
 25 detected said interference wave signal having a frequency equal
 to said predetermined transmission frequency, said controlling
 means makes a request to change said predetermined transmission
 frequency to another transmission frequency, and wherein when
 said receiving means has received and detected said
 30 interference wave signal lying within said transmission band

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of frequencies, but having a frequency different from said predetermined transmission frequency, said controlling means furnishes a notify signal indicating the detection of the interference wave signal.

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3. The interference wave detecting device according to Claim 1, wherein only when said transmitting means is transmitting one or more continuous null time slots of said radio signal, said control means causes said transmitting means to stop transmitting said radio signal of said predetermined transmission frequency to said mobile station.

4. The interference wave detecting device according to Claim 3, wherein only when said receiving means is receiving one or more continuous null time slots of said radio signal from said mobile station, said control means enables said receiving means to receive said interference wave signal.

5. The interference wave detecting device according to Claim 3, wherein in order to detect said interference wave signal lying within said transmission band of frequencies, but having a frequency different from said predetermined transmission frequency, said control means causes said receiving means to tune from said predetermined reception frequency to a different reception frequency and then receive said interference wave signal having a frequency different from said predetermined transmission frequency.

6. The interference wave detecting device according to Claim 5, further comprising a plurality of synthesizers,

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wherein said control means causes said redeiving means to change said predetermined reception frequency to another transmission frequency by switching among said plurality of synthesizers.

5 7. The interference wave detecting device according to Claim 1, wherein in order to detect an interference wave signal having the same frequency as said radio signal being transmitted thereto by said mobile station, said controlling means recognizes, as said interference wave signal, said radio signal
10 received by said receiving means within a period of time during which one or more continuous null time slots of said radio signal are being received.

15 8. The interference wave detecting device according to Claim 1, wherein in order to detect an interference wave signal lying within a certain reception band of frequencies, but having a frequency different from that of said radio signal being transmitted thereto by said mobile station, said controlling means causes said receiving means to tune from said
20 predetermined reception frequency to a different reception frequency within a period of time during which one or more continuous null time slots of said radio signal are being transmitted by said transmitting means, and recognizes, as said interference wave signal, said radio signal received by said
25 receiving means within a period of time during which one or more continuous null time slots of said radio signal are being received, after said receiving means has changed said predetermined reception frequency.

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Claim 1, wherein said controlling means causes said transmitting means to transmit a radio signal including test data, and, when said receiving means receives said radio signal, compares said test data included in said radio signal transmitted by said transmitting means with test data included in said received radio signal.

10. An interference wave detecting device comprising:
transmitting means for converting data to be transmitted from a base station into a radio signal of a predetermined transmission frequency, and for transmitting said radio signal to a mobile station;

a first receiving antenna for receiving a signal lying within a certain reception band of frequencies including a predetermined reception frequency from said mobile station;

first high-frequency amplifying means for amplifying said signal received by said first receiving antenna and for allowing only those signal components within the amplified signal to pass which are within a limited range of frequencies;

a second receiving antenna for receiving another signal lying within a certain transmission band of frequencies including a predetermined transmission frequency;

second high-frequency amplifying means for amplifying said other signal received by said second receiving antenna and for allowing only those signal components within the amplified other signal to pass which are within a limited range of frequencies;

first local oscillating means for generating a first local oscillating signal;

second local oscillating means for generating a second

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local oscillating signal of a frequency equal to the difference between said predetermined transmission frequency and said predetermined reception frequency;

5 mixing means for mixing said other signal amplified by said second high-frequency amplifying means and said second local oscillating signal so as to convert said amplified other signal into an output signal of said predetermined reception frequency;

10 selecting means for selecting either said output signal from said mixing means or said signal of said predetermined reception frequency amplified by said first high-frequency amplifying means, and for furnishing the selected signal;

15 reception level detecting means for converting said selected signal from said selecting means into an intermediate frequency or IF signal using said first local oscillating signal from said first local oscillating means, and for detecting the level of said selected signal; and

20 controlling means for causing said transmitting means to stop transmitting said radio signal and for causing said selecting means to select said output signal of said predetermined reception frequency from said mixing means in order to receive and detect an interference wave signal lying within said transmission band of frequencies.

25 11. The interference wave detecting device according to Claim ¹⁰ 1, wherein said first local oscillating means includes two local oscillators for generating two local oscillating signals of different frequencies, and wherein said interference wave detecting device further comprises second selecting means
30 for selectively furnishing either of said two local oscillating

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signals as said first local oscillating signal to said reception level detecting means according to whether or not to detect an interference wave signal of a frequency equal to said predetermined transmission frequency.

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12. A method of detecting interference waves, comprising the steps of:

converting data to be transmitted from a base station into a radio signal of a predetermined transmission frequency, and transmitting said radio signal to a mobile station;

receiving a radio signal lying within a certain reception band of frequencies including a predetermined reception frequency from said mobile station; and

in order to detect an interference wave signal lying within a certain transmission band of frequencies including said predetermined transmission frequency, stopping the transmission of said radio signal of the predetermined transmission frequency to said mobile station and receiving said interference wave signal.

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13. The interference wave detecting method according to Claim 12, further comprising the steps of, when said interference wave signal having a frequency equal to said predetermined transmission frequency has been detected, making a request to change said predetermined transmission frequency to another transmission frequency, and, when said interference wave signal lying within said transmission band of frequencies, but having a frequency different from said predetermined transmission frequency has been detected, furnishing a notify signal indicating the detection of the interference wave

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14. The interference wave detecting method according to Claim 12, wherein in said stopping step, the transmission of said radio signal of said predetermined transmission frequency to said mobile station is stopped only when one or more continuous null time slots of said radio signal are being transmitted to said mobile station.

15. The interference wave detecting method according to Claim 14, further comprising the step of enabling said receiving step of receiving said interference wave signal only when one or more continuous null time slots of said radio signal is being transmitted from said base station.

16. The interference wave detecting method according to Claim 14, further comprising the step of, in order to detect an interference wave signal lying within said transmission band of frequencies, but having a frequency different from said predetermined transmission frequency of said radio signal being transmitted to said mobile station, changing said predetermined reception frequency to a different frequency so as to detect said interference wave signal having a frequency which is different from said predetermined transmission frequency.

17. The interference wave detecting method according to Claim 16, further comprising the steps of providing a plurality of synthesizers, and changing said predetermined reception frequency by switching among said plurality of synthesizers.

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18. The interference wave detecting method according to Claim 12, further comprising the step of, in order to detect an interference wave signal of a frequency equal to said predetermined reception frequency, recognizing, as said interference wave signal, said radio signal received within a period of time during which one or more continuous null time slots of said radio signal are being received.

19. The interference wave detecting method according to Claim 12, further comprising the steps of, in order to detect an interference wave signal lying within a certain reception band of frequencies, but having a frequency different from that of said radio signal being transmitted by said mobile station, changing said predetermined reception frequency to a different frequency within a period of time during which one or more continuous null time slots of said radio signal are being transmitted to said mobile station, and recognizing, as said interference wave signal, said radio signal received within a period of time during which one or more continuous null time slots of said radio signal are being received, after said predetermined reception frequency has been changed.

20. The interference wave detecting method according to Claim 12, further comprising the steps of transmitting a radio signal including test data, and, upon receipt of said radio signal, comparing said test data included in said radio signal transmitted in said transmitting step with test data included in said received radio signal.

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